

WD/ST/72/5

INTERIM REPORT ON FIELD ANALYTICAL DATA ON
GROUNDWATERS FROM THE JALU-TAZERBO PHASE I AREA

by

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Attached are the results of field analyses of seven groundwaters from the Phase I area, measured during the visit by Dr W M Edmunds in April 1972. The only wells suitable for measurement of these variables are discharging wells and at the time of the visit data could only be obtained from boreholes in the Occidental 103 A and D fields. Similar measurements are being made during pumping tests of the Phase I area exploration - production wells. Prior to analysis, arrangements were made where necessary to shut off corrosion inhibitors and gas blankets at least 24 hours before sampling took place, so as to ensure that the measurements referred only to groundwater in the natural state. Two camp wells at 103 D field were the only wells available where water could be sampled, which had not been subjected to corrosion protection.

It can be seen that all the waters from the Upper Sands have fairly constant pH and bicarbonate values, low free CO_2 , low sulphide and high eH values. From these data it can be deduced that the waters are undersaturated with respect to calcite, and therefore should not present problems of encrustation unless strongly aerated. In addition the waters contain some oxygen as indicated by the eH values and should not contain Fe^{2+} in solution in excess of about 0.05 mg/l. No bacterial analyses were made of these waters but from the above data it can be inferred that sulphate reducing bacteria are absent in the natural environment. Corratel readings are also given for two wells in 103 D field for three types of steel; these readings were taken during field trials with the corratel.

Although the waters from the Upper Sands in their natural state contain some oxygen, have high eH values and do not contain sulphide, these conditions can change quite suddenly if accidental contamination by anaerobic bacteria should occur. This should be taken into consideration for example in planning transit lines etc.

The two Oligocene wells have relatively low pH and low eH values and also low free CO_2 . The eH-pH values indicate that these waters are capable of dissolving ferrous iron. No sulphide was detected during the recent investigations. Encrustation by calcium carbonate should not be a problem, but deposition of ferric hydroxides if the water is aerated, or of ferrous sulphide if H_2S is introduced may present problems.

FIELD ANALYTICAL DATA ON SEVEN SAMPLES OF WATER FROM JALU-TAZAREO
PHASE I AREA

All results in mg/litre

Well identity	WW 36	WW 37	WW 81	WW *	WW +	WW 51	WW 52
Field	103 A	103 A	103 A	103 D	103 D	103 D	103 D
Location	29° 01' 37" N 20° 45' 01" E	29° 01' 17" N 20° 45' 26" E	-	-	-	28° 53' 21" N 20° 57' 54" E	28° 53' 21" N 20° 57' 54" E
Aquifer	Oligocene	Upper Sands	Upper Sands	Upper Sands	Upper Sands	Oligocene	Upper Sands
Date of analysis	5.4.72	5.4.72	6.4.72	4.4.72	4.4.72	13.4.72	13.4.72
Temperature (°C)	47.2°	27.5°	27.8°	27.5°	26.8°	46.5°	28.0°
Field pH ¹	6.93	7.31	7.33	7.38	7.33	7.06	7.29
Field HCO ₃ ⁻	173	205	195	205	235	166	235
Free CO ₂ (calc.)	10	15	15	12	17	14	18
Field eH (millivolts)	-94	+180	+377	+280	+245	-25	+167
Sulphide ²	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

- Notes:
- * Main 103 D camp well - feeding supply tank, identity uncertain
 - + Main 103 D camp well direct to distribution, identity uncertain
 - 1 Precision of pH readings ± 0.05 pH unit
 - 2 No sulphide detectable by smell and therefore values below 0.001 mg/l

Corrator readings		WW 51-103 D (Oligocene)	WW 52-103 D (Upper Sands)
Average A Average B		Average A Average B	
1010 steel	+ 30 + 48	+ 15 + 50	
1020 steel	+ 3.8 + 5.1	+ 18 + 6.5	
316 stainless steel	+ 1.1 + 1.1	n.d. n.d.	